The Examiner further objected to the Specification because of typographical errors appearing throughout the Specification. Applicant has corrected the typographical errors pointed out by the Examiner.

The Examiner has also objected to the incorporation in the Specification by reference of a publication. The Examiner required Applicant to amend the disclosure to include the material incorporated by reference. The publication which the Examiner is referring to is an article concerning EMI tests on a brushless actuator. Applicant did not intend to incorporate the teachings of this article into the application by reference. Applicant is merely referring to the EMI test article as background in the same manner that Applicant refers to U.S. Patent No. 4,774,428 issued to Konecny, merely as background. The teachings of the EMI test article are not essential to the disclosure of the invention. It is therefore respectfully requested that the Examiner withdraw the requirement to include the EMI test article in this application. Applicant has amended Pages 3 and 7 of the Specification to make it clear that Applicant is not attempting to incorporate the EMI test article into the application by reference.

The Examiner objected to Claims 1 through 15 based on certain informalities. Applicant has made the changes to the claims as suggested by the Examiner, except for Claim 11, which Applicant has cancelled.

Claims 1 through 15 were rejected under 35 U.S.C. § 112 as being indefinite. Applicant has amended Claims 1, 2, 3, 4, 8, 12, 14 and 15 in order to overcome the indefiniteness.

Claim 11 was rejected under 35 U.S.C. § 103 as being unpatentable over Japanese Patent No. 10-285891 issued to Katsuta in view of British Patent No. 2 289 991 issued to Chan. While Applicant disagrees that Claim 11 is obvious over the Katsuta and Chan patents, Applicant has cancelled Claim 11 in order to expedite the prosecution of this application. Claim

11 is cancelled without prejudice so that Applicant might file a continuation application in an effort to obtain allowance of Claim 11.

In view of the above Amendment and Remarks, it is believed that this application is in condition for allowance and an early allowance is solicited.

Respectfully submitted,

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MARK-UP VERSION OF SPECIFICATION

On Page 2, delete the first paragraph and replace it with the following:

This kind of winding with one coil per slot simplifies the assembling of the rotor position sensors (i.e. Hall detectors) near the air gap. The Hall detectors are fixed on the side of several teeth which have no winding and they are using the leakage flux of the permanent magnets to detect the rotor position.

On Pages 2 and 3, delete the paragraph bridging Pages 2 and 3 and replace it with the following:

The electronic supply includes a power electronics system and a control electronics system. Both systems can be inserted inside the motor housing, in the center of the stator yoke. The power electronics system is composed of an inverter with six Mosfets or multiple Mosfets which operate like six Mosfets. The structure diodes of the mosfets are used to ensure the current reversibility. At each sequence of conduction defined by the rotor position detector, two transistors are switched on to supply two motor phases. In the classical mode of operation, a modulation signal is applied on the gate of these two systems. Both systems can be inserted inside the motor housing, in the center of the stator yoke. The power electronics system is composed of an inverter with six Mosfets or multiple Mosfets which operate like six Mosfets. The structure diodes of the mosfets are used to ensure the current reversibility. At each sequence of conduction defined by the rotor position detector, two transistors are switched on to supply two motor phases. In the classical mode of operation, a modulation signal is applied on the gate of these two transistors. This method simplifies the

control realization and only one current sensor can be inserted in the DC bus for the current measurement.

On Page 3, delete the first full paragraph and replace it with the following:

Another solution consists in applying the modulation signal on one transistor only at each sequence of operation: this method is a single switch modulation technique. The other transistor is switched "on" during all the duration of this sequence of conduction. An example of the single switch modulation ~~This mode of operation~~ is described in an article titled E.M.I. tests on a brushless actuator: is described in Comparison of M. Lajoie-Mazene, J.P. Berry - European Power Electronics - Brighton (U.K.), September 1993 (EMI Tests) ~~[2]~~, in the case of motoring operation only, compared to the classical mode of operation where the modulation signal is applied on the gate of the two transistors. It is shown that the single switch modulation provides lower electromagnetic interferences (EMI and reduces the commutation losses, the conduction losses in low voltage applications, the current ripple and the size of the input filtering capacitor. The proposed electronic system is using the single switch modulation and it can be used for motor as well as generator operation. Consequently, the current regulation is realized without any external current sensor.

On Page 4, delete the first paragraph and replace it with the following:

Another feature of the invention is that the assembling of the rotor position sensor (i.e. Hall detectors) near the air gap is simplified by the winding configuration. The H~~h~~all detectors are fixed on the side of several teeth which have no winding and they are using the leakage flux of the permanent magnets to detect the rotor

position. The amount of vibrations, the cogging torque ripple and the radial force are greatly reduced.

On Page 7, delete the second full paragraph and replace it with the following:

As shown in Fig's 3 and 4, a concentrated winding 22 is wound around the teeth 23. The advantages of a concentrated winding around the teeth in comparison with a classical distributed winding are described in Konecny U.S. Pat. No. 4,774,428 and the EMI Tests article referred to above. ~~reference E.M.I. tests on a brushless actuator: Comparison of different operation modes- J. Cros, S. Astier, J.M. Vinassa, M. Lajoie-Mazenc, J.P. Berry European Power Electronics - Brighton (UK), September 1993. [1]~~ The volume of copper is reduced and subsequently the Joule losses are minimized. The energy efficiency and the motor starting torque per unit volume of winding are maximized.

MARK-UP VERSION OF CLAIMS

1. (Amended) A brushless DC motor/generator (10) comprising; a cylindrical outer rotor (19) with twenty two poles (20) constructed with segments of permanent magnet material alternatively magnetized north and south, a stator core (8) of ferromagnetic material spaced inwardly of said rotor and defining a magnetic clearance gap (9) ~~therebetween~~ there between, said stator core having twenty-four slots (18) and defining teeth (23) between said slots (18), a three phase winding with coils (7) of insulated wire being wound around the teeth, an electronic supply (11) including a power electronics system and a current control circuit means (14) to control the torque of said motor (10) and therefore its arresting force for braking a wheel (53) of devices on which people are displaced by said DC motor motorizing said wheel, characterized in that there is one coil per slots with predetermined connection patterns: A', C, C, B', B', A, A, C', C', B, B, and A' resulting in reduced torque ripple without any slot or magnet skewing.

2. (Amended) A brushless DC motor/generator (10) comprising; a cylindrical outer rotor (19) with twenty two poles (20) constructed with segments of permanent magnet material alternatively magnetized north and south, a stator core (8) of ferromagnetic material spaced inwardly of said rotor and defining a magnetic clearance gap (9) ~~therebetween~~ there between, said stator core having twenty-four slots (18) and defining teeth (23) between said slots (18), a three phase winding with coils (7) of insulated wire being wound around the teeth, an electronic supply (11) including a power electronics system and a current control

circuit means (14) to control the torque of said motor (10) and therefore its arresting force for braking a wheel (53) of devices on which people are displaced by said DC motor motorizing said wheel, characterized in that ~~an additional~~ there are two coils (7) per slot (18) with predetermined connection patterns: C', C, C', C, B, B', B, B', A', A, A', A, C, C', C, C', B', B, B', B, A, A', A, A', resulting in reduced torque ripple without any slot or magnet skewing.

Claim 3 (2x Amended) A brushless DC motor/generator (10) as claimed in claim 1 characterized in that a multiple combination of additions of the number of said twenty-two poles and said twenty-four slots (18), such as forty-four said poles and forty-eight said slots, or sixty-six said poles and seventy-two said slots or ninety-six said poles and eighty-eight said slots; and a wound winding (7) around said teeth (23) ~~with one of either one coil per slot or two coils per slot~~.

4. (2x Amended) A brushless DC motor/generator (10) as claimed in claim 1 characterized in that there are three Hall sensors (24) ~~are~~ mounted near said air gap (25) at predetermined positions ~~and fixed to or side some of said teeth (23)~~.

6. (Amended) A brushless DC motor/generator (10) as claimed in claim 5 characterized in that said single switch modulation technique is comprised of three of said mosfets (30) being connected ~~as~~ at an upper side of said inverter (28) and remain switched "on" by a modulation signal during a motor operation mode of said motor (10), three others of said mosfets (30) being connected as a

lower side of said inverter (28) and used to measure motor phase currents during all sequences of the mosfets of said upper side.

8. (2x Amended) A brushless DC ~~M~~motor/generator (10) as claimed in claim 1 characterized in that said motor (10) is also used as a wheel braking device when used in a generator mode ~~said rotor (19) being connected to a hub (52) of a wheel (53) powered by said motor (10) when in a motorized mode~~.

9. (2x Amended) A brushless DC ~~M~~motor/generator (10) as claimed in claim 1 characterized in that said control circuit means (14) comprises: a power electronics three phase inverter (28) provided with six power mosfets (30), a current control system (14) coupled to said inverter (28) for generation of 120 electrical degrees rectangular phase current pulses, an electronic control system (32) for both a motor and a generator operation mode of said motor (10) ~~and using a single switch modulation technique~~.

Cancel Claim 11.

12. (Amended) A brushless DC motor/generator (10) as claimed in claim 2 characterized in that a multiple combination of additions of the number of said twenty-two poles and said twenty-four slots (18), such as forty-four said poles and forty-eight said slots, or sixty-six said poles and seventy-two said slots or ninety-six said poles and eighty-eight said slots; and a ~~wound~~ winding wound (7) around said teeth 23) ~~with one of either one coil per slot or two coils per slot~~.

13. (Amended) A brushless DC motor/generator (10) as claimed in claim 2 characterized in that there are three Hall sensors (24) ~~are~~ mounted near said air gap (25) at predetermined positions ~~and fixed to or side some of said teeth (23)~~.

14. (Amended) A brushless DC ~~M~~motor/generator (10) as claimed in claim 2 characterized in that said motor (10) is also used as a wheel braking device when used in a generator mode ~~said rotor (19) being connected to a hub (52) of a wheel (53) powered by said motor (10) when in a motorized mode~~.

15. (Amended) A brushless DC ~~M~~motor/generator (10) as claimed in claim 2 characterized in that said control circuit means (14) comprises: a power electronics three phase inverter (28) provided with six power mosfets (30), a current control system (14) coupled to said inverter (28) for generation of 120 electrical degrees rectangular phase current pulses, an electronic control system (32) for both a motor and a generator operation mode of said motor (10) ~~and using a single switch modulation technique~~.